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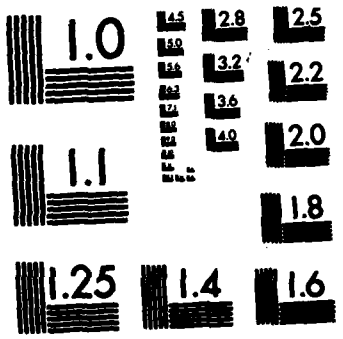

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Work was emphasized that related the theory of nonlinera waves and control-system theory via the differential geometric methodology.

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FINAL REPORT

The aim throughout the term of this grant was to develop the mathematical methodology involved in the application of modern differential geometry to as wide a variety as possible of problems in control system theory and mathematical physics. Indeed, a special feature of the work has been an unusual degree of commonality between control-system theory an physics. In contrast to my previous work, I have emphasized the preparation of articles for publication in the journals most widely read by control theorists and mathematical physicists. The appended bibliography lists the journal article which ahve resulted.

I believe that the three years of research has been unusually successful, and has produced new ideas in the application of mathematics which will be quite useful in coming years. The work was supported jointly by the Ames Research Center of NASA, where a group under the leadership of George Meyer has been involved with thedesign of new control systems for helicopters and other aircraft. Articles 6, 15, 16 and 13 show particular promise of application to these new geometric control techniques.

On the physics side, I have discussed this resaerch with Frank Estabrook of JPL and Martin Kruskal of Princeton University; I believ this work (paryiculary #2,3, 12, and 16) will link up with theirs.

ROBERT HERMANN

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ROBERT HERMANN

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